EXCERPT FROM THE
PROCEEDINGS

OF THE

EIGHTH ANNUAL ACQUISITION
RESEARCH SYMPOSIUM
WEDNESDAY SESSIONS
VOLUME I

The Impact of U.S. Export Control and Technology Transfer Regime on the Joint Strike Fighter (JSF) Project—A UK Perspective

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Published: 30 April 2011

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Prepared for the Naval Postgraduate School, Monterey, California 93943

ACQUISITION RESEARCH PROGRAM
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Report Documentation Page			*Form Approved* *OMB No. 0704-0188*

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1. REPORT DATE **APR 2011**	2. REPORT TYPE	3. DATES COVERED **00-00-2011 to 00-00-2011**

4. TITLE AND SUBTITLE **The Impact of U.S. Export Control and Technology Transfer Regime on the Joint Strike Fighter (JSF) Project - A UK Perspective**	5a. CONTRACT NUMBER
	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Cranfield University,College Road, Cranfield,Bedfordshire MK43 0AL, United Kingdom,**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
 Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES
 Presented at the Naval Postgraduate School?s 8th Annual Acquisition Research Symposium, 10-12 May 2011, Seaside, CA. U.S. Government or Federal Rights License

14. ABSTRACT
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15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**Same as Report (SAR)**	**38**	

The research presented at the symposium was supported by the Acquisition Chair of the Graduate School of Business & Public Policy at the Naval Postgraduate School.

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Preface & Acknowledgements

During his internship with the Graduate School of Business & Public Policy in June 2010, U.S. Air Force Academy Cadet Chase Lane surveyed the activities of the Naval Postgraduate School's Acquisition Research Program in its first seven years. The sheer volume of research products—almost 600 published papers (e.g., technical reports, journal articles, theses)—indicates the extent to which the depth and breadth of acquisition research has increased during these years. Over 300 authors contributed to these works, which means that the pool of those who have had significant intellectual engagement with acquisition issues has increased substantially. The broad range of research topics includes acquisition reform, defense industry, fielding, contracting, interoperability, organizational behavior, risk management, cost estimating, and many others. Approaches range from conceptual and exploratory studies to develop propositions about various aspects of acquisition, to applied and statistical analyses to test specific hypotheses. Methodologies include case studies, modeling, surveys, and experiments. On the whole, such findings make us both grateful for the ARP's progress to date, and hopeful that this progress in research will lead to substantive improvements in the DoD's acquisition outcomes.

As pragmatists, we of course recognize that such change can only occur to the extent that the potential knowledge wrapped up in these products is put to use and tested to determine its value. We take seriously the pernicious effects of the so-called "theory–practice" gap, which would separate the acquisition scholar from the acquisition practitioner, and relegate the scholar's work to mere academic "shelfware." Some design features of our program that we believe help avoid these effects include the following: connecting researchers with practitioners on specific projects; requiring researchers to brief sponsors on project findings as a condition of funding award; "pushing" potentially high-impact research reports (e.g., via overnight shipping) to selected practitioners and policy-makers; and most notably, sponsoring this symposium, which we craft intentionally as an opportunity for fruitful, lasting connections between scholars and practitioners.

A former Defense Acquisition Executive, responding to a comment that academic research was not generally useful in acquisition practice, opined, "That's not their [the academics'] problem—it's ours [the practitioners']. They can only perform research; it's up to us to use it." While we certainly agree with this sentiment, we also recognize that any research, however theoretical, must point to some termination in action; academics have a responsibility to make their work intelligible to practitioners. Thus we continue to seek projects that both comport with solid standards of scholarship, and address relevant acquisition issues. These years of experience have shown us the difficulty in attempting to balance these two objectives, but we are convinced that the attempt is absolutely essential if any real improvement is to be realized.

We gratefully acknowledge the ongoing support and leadership of our sponsors, whose foresight and vision have assured the continuing success of the Acquisition Research Program:

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James B. Greene, Jr.   Keith F. Snider, PhD
Rear Admiral, U.S. Navy (Ret.)   Associate Professor

Panel 3 – Acquisition Issues: A Global Context

Wednesday, May 11, 2011	

11:15 a.m. – 12:45 p.m.	**Chair: Alfred G. Volkman,** Director, International Cooperation, Office of the Under Secretary of Defense for Acquisition, Technology, & Logistics
	
	The Impact of U.S. Export Control and Technology Transfer Regime on the Joint Strike Fighter (JSF) Project—A UK Perspective
	
	     David Moore, Peter Ito, Stuart Young, Kevin Burgess, and Peter Antill, Cranfield University
	
	International Perspectives of the Impact of Export Control and Technology Transfer Regimes: The F/A-18 Case Study
	
	     Raymond Franck, Ira Lewis, Bernard Udis, NPS
	
	NATO Agency Reform
	
	     Eugene Warner, U.S. Mission to NATO

Alfred G. Volkman—Director, International Cooperation for the Under Secretary of Defense (Acquisition, Technology, and Logistics). Mr. Volkman is responsible for establishing international Armaments cooperation policy, ensuring that policy is properly implemented, and engaging with U.S. allies and friends around the world to achieve closer cooperation.

Mr. Volkman has a long history in international cooperation beginning in the late 1970s when he negotiated the initial agreements with the United Kingdom that resulted in the cooperative development of the AV-8B Harrier Aircraft. In the early 1980s he served on the NATO Air Command and Control Systems team in Brussels, Belgium, where he was instrumental in shaping the international acquisition strategy for that program. Mr. Volkman has served in a variety of international staff positions for both the Department of the Navy and the Office of the Secretary of Defense.

Mr. Volkman has extensive acquisition experience. He began his civilian career as a contracting specialist and contracting officer with the Naval Air Systems Command and has served as both the Director of Contract Policy and Administration and the Director of Foreign Contracting in the Office of the Secretary of Defense.

Mr. Volkman has a Bachelor of Arts degree from Valparaiso University and a Master of Business Administration from George Washington University. He served as an officer in the United States Army from 1966 to 1969. His service included one year with the Military Assistance Command, Vietnam. He has received numerous awards and medals for distinguished performance throughout his military and civilian service.

Mr. Volkman is married and has three adult children.

The Impact of U.S. Export Control and Technology Transfer Regime on the Joint Strike Fighter (JSF) Project—A UK Perspective

David Moore—Mr. Moore worked in purchasing, logistics, and supply chain management within the public sector and commercial organisations before entering academia. He has designed, developed, and delivered a range of professional courses, undergraduate and master's programmes for organisations and universities. He has undertaken extensive education, training, speaking, and consultancy assignments in the UK, USA, Europe, Middle East, and Far East. Particular interests include outsourcing, using contractors for service provision, developing professionalism, and humanitarian logistics. He has written a number of books, book chapters, and conference and journal papers. Moore completed his service in the Royal Logistic Corps as a Lt Colonel in 1999. [d.m.moore@cranfield.ac.uk]

Peter Ito—Mr. Ito earned a bachelor's degree in Political Science from the University of California at Berkeley, and a Juris Doctor (law) degree and a master's degree in International Affairs from George Washington University in Washington, DC. He worked for 25 years as a Foreign Service Officer for the U.S. State Department, serving in South Korea, Denmark, Germany, The Netherlands, and Washington, DC. His primary focus was political affairs, particularly defence and security policy. He joined Cranfield University in September 2007, working as a researcher in the areas of strategic management and change management, before moving to his current position. [p.ito@cranfield.ac.uk]

Stuart Young—Mr. Young retired from the Royal Navy as an engineer officer in 2008, having served in a variety of postings at sea and in the UK Ministry of Defence. These included three years based in the British Embassy in Washington as a technical liaison officer, and as programme manager for a major multi-national technology development programme. In his final appointment he was responsible for the development of acquisition management skills for military and civilian personnel across the MoD. Joining Cranfield University in 2008, he is Deputy Director of the Centre for Defence Acquisition, with a particular interest in the relationship between the MoD and industry, and the development of acquisition strategies for major defence programmes. [s.young@cranfield.ac.uk]

Kevin Burgess—Mr. Burgess has both private and public-sector experience. In the past 20 years he has held a range of senior management and executive roles in asset intensive industries, namely Telcos and Railways. Prior to joining Cranfield, Mr. Burgess's last job in industry in 2008 was as Group General Manager, Shared Services in QR (a railway with over A$ 3 billion annual revenue and 15,000 staff). In this role he reported directly to the CEO, had 985 staff, and A$600 million annual operating budget. His corporate-wide responsibilities included information technology, project management (capital program of A$10 billion), learning and development, supply (A$ 1 billion p.a.), HR services, financial services, property (A$600 million in assets), and rollingstock engineering. He has 10 years experience as a Business Excellence Evaluator (U.S. equivalent of the Baldridge Award). His academic interests have been primarily on integrating social and technical systems in order to improve overall corporate performance. His PhD was in innovation in supply chains. He is widely published and currently holds the title of Adjunct Professor in three Australian Universities. [k.burgess@cranfield.ac.uk]

Peter Antill—Mr. Antill is currently a research assistant working for Cranfield University at the UK Defence Academy's College of Management and Technology in Shrivenham. Mr. Antill has practical experience in the service industry as well as the civil service. A degree holder from Staffordshire University and the University College of Wales, Aberystwyth, he also holds a PGCE (Post Compulsory Education) from Oxford Brooks University. A published author, he is currently conducting postgraduate research into British defence policy, historical procurement programmes, and expeditionary operations, as well as privately collaborating with two colleagues in a military history project. [p.antill@cranfield.ac.uk]

Abstract

The research assessed the international impact of the U.S. export control and technology transfer regime, with a focus on the UK experience with the U.S. requirements as they relate to the Joint Strike Fighter (JSF) and the impact on logistical support for the JSF fleet. UK government and industry representatives indicated agreement with the goals of U.S. policy, skepticism regarding the impact of those policies on effective project management, and harsh criticism of the process by which the U.S. controls are implemented.

The data indicated that interviewees found U.S. requirements generated significant delay, increased costs, dampened initiative to increase capability or efficiency, established critical and unnecessary restrictions on information sharing, and constructed barriers to effective supply chains. The UK representatives believed that the U.S. has generated a complex system which attempts to regulate all items, and thereby fails to provide a focus on effective security for truly sensitive items. With regard to the impact of U.S. requirements on the future JSF logistical support arrangements, it was too early in the process for UK interviewees to have solid views. There was great sympathy for UK firms to design around U.S. requirements and avoid becoming enmeshed in the U.S. regime.

> *"In all candour, I would encourage UK industry to design around the U.S. International Trafficking in Arms Regulations (ITAR) and produce ITAR-free items."*

> –Rt. Hon. James Arbuthnot, Chairman of the UK House of Parliament Defence Committee

> *"One of our suppliers had a fire at their facility. We determined that it was better to wait for them to rebuild their facility than try to get U.S. approval for an alternate supplier."*

> –UK Industry Representative

Background to the Research

The research project assessed the international impact of the U.S. export control and technology transfer regime and was conducted jointly by Cranfield University and the U.S. Naval Postgraduate School. Cranfield focused on two specific areas: the UK experience with the U.S. requirements as they relate to the JSF (or F-35), and the impact of U.S. regulations on logistical support for the worldwide JSF fleet. The goal of the research was to generate insights into the nature and extent of the impact of U.S. requirements and identify alternate approaches to the current regime. The focus was on ascertaining the UK perspective on the actual impact of ITAR regulations with regard to JSF, which could have utility in assessing the impact of those rules on cooperation with Allies and partners.

The Cranfield researchers expected that the efforts would complement other studies of U.S. export controls, such as the report by Bialos, Fisher, and Koehl (2009). However, the scope of this project permitted only a partial investigation of the entire question of U.S. policy and process. And while there has been some initial consideration among UK participants on the major issue of logistical support for the JSF, and some of the areas of concern are already apparent, it would be worthwhile to conduct further research on this issue at a later stage when more decisions have been reached, and the support requirements and arrangements have become clearer.

Research Methodology

Cranfield received data from nine industry representatives and seven UK government officials working on the JSF. There were 15 interviews conducted (in person or by telephone) within the framework of an extensive questionnaire, but the interviewees were encouraged to address any issues they thought were critical. As a result, they covered a wide range of issues, ranging from broad policy to details regarding suppliers. One individual provided purely written responses to the points in the questionnaire. There are also 15 responses from those 16 interviewees to a separate, Likert scale questionnaire. The one exception was that of the Rt. Hon. James Arbuthnot, the Chairman of the House of Commons Defence Committee, where it was simply inappropriate to put the request for the completion of that questionnaire. The industry responses are noted in bold and the responses from government officials are in italics and underlined.

Each individual who participated in the interview was asked whether his/her comments were for attribution. With the exception of Chairman Arbuthnot, all interviewees made clear that their comments were not for attribution. The companies which participated in this research stated that they required an opportunity to review the Cranfield report to ensure that anything their employees said was not an inadvertent release of sensitive information. Cranfield made clear that their right to edit only extended to the comments of their employees. Cranfield will be holding the raw data from the interviews. Should any reader wish to access the raw data, the request will need to go to the relevant company or government body, and that entity (or individual) will decide whether to provide access to the original material.

It is important to note that the interviewees commented that it can be difficult to distinguish when JSF problems arose due to ITAR, and which are inherent in a process where UK firms are dealing with U.S. firms on a complex military project. An additional complication is the fact that the UK firms do not generally deal directly with the U.S. government on ITAR-related requests, but need to pass them through a U.S. firm (particularly Lockheed Martin, the JSF prime contractor), although UK firms work with people from, for example, the JSF project office, as needed, to address specific issues.

Experience of Interviewees on JSF and U.S. Requirements

The individuals interviewed were selected as they are substantially involved with U.S. requirements and their impact on the JSF. The interviewees were asked to provide a response to the statement "U.S. export control and technology transfer requirements had a significant impact on the conduct of my work on the JSF." Responses for the industry representative averaged 7.7. For the government employees, excluding Chairman Arbuthnot (who has had an extensive interest on JSF and U.S. regulations), the average was 7.5.

Strongly Disagree									Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10	
		(1)		**(1)**			**(3)**	**(2)**	**(2) (Ind.)**	
				_(1)_		_(1)_	_(1)_	_(1)_	_(2) (Gov.)_	

Acceptance of Rationale for U.S. Export Controls

Before addressing the details of how U.S. export control and technology transfer policy was implemented, it was worthwhile to gauge the extent of support among UK representatives for the goals of that policy. The specific statement put to the interviewees

was "There was a clear rationale for the U.S. requirements." There appeared to be a wide variety of views across the spectrum, with more support among industry representatives than government representatives. For industry, the average was 6.8., and for government representatives, 5.5.

Strongly Disagree									Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10	
	(1)	**(1)**			**(2)**		**(1)**	**(3)**	**(1) (Ind.)**	
(1)			*(1)*	*(1)*	*(1)*		*(2)*		*(Gov.)*	

What became noticeable in the conduct of interviews was that the commentary indicated substantial UK support for the idea that sensitive technology needs to be protected. The fault may have been in the way the statement was phrased, as the "requirements" may have been thought to encompass the process as well as the policy, where there was little UK support for the former, but substantial understanding for the latter. One government representative stated there is no objection to a complex, intensive system for truly sensitive items. An industry representative expressed full agreement with the rationale for U.S. regulations, and added that the justifications have been made clear. Yet another industry interviewee commented that ITAR, strictly speaking, is not a problem.

However, even the statements of understanding for U.S. policy were augmented with varying levels of criticism of U.S. practice. One industry representative stated that the problem is that the regulations are too broad, and as there is no discrimination among items, the U.S. regime covers low-technology items as well. One government representative opined that ITAR does not deserve its bad reputation, but ultimately commented that ITAR is a "well-maintained car which unfortunately is a Model T and not a Porsche." Another government participant stated that U.S. regulations are a minor irritant, and not a major problem. However, even this interviewee described the U.S. system as "bizarre."

Critical Delays

The most frequently cited criticism from UK representatives was that ITAR generates significant delays. In response to the statement that "U.S. requirements generated major delays," the responses from UK industry representatives averaged 6.0, and for government representatives, 5.3.

Strongly Disagree									Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10	
(1)	**(1)**	**(1)**		**(1)**	**(1)**	**(1)**			**(3) (Ind.)**	
	(1)	*(1)*		*(1)*		*(2)*	*(1)*		*(Gov.)*	

One industry representative cited the estimate generally provided by interviewees that it takes 6–9 months for JSF requests to be processed in Washington. That has an impact on numerous aspects of the project. Another industry participant focused on the issue of suppliers and stated that the delay and loss of time is a "threat" to JSF. As it takes so long to get approval for a new source or supplier, firms decide not to do so. Regular suppliers raise prices knowing they have a guaranteed position, since the firm being supplied is not going to try to replace them with cheaper or better suppliers. The interviewee said the delay is hard to fathom, as other countries process such changes in two months, and the UK can do it in days.

Another industry interviewee addressed a different aspect of the issue of ITAR-generated delay. He stressed that the delay in U.S. processing has a particular impact on urgent requests from UK industry. In some cases, the company will have a pressing requirement, but it is thrown into the process for consideration along with routine requests and the company cannot count on an expeditious response. That can have practical impacts, such as production having to be slowed due to the need to wait for a U.S. decision on an unresolved technical issue.

Yet another industry representative noted that difficulties arise from the fact that ITAR does not align with the work timeline. The conflict between project timescales and ITAR timescales forces decisions to be made ahead of full information being available, especially long lead items which may need to be ordered within the first six months of the project.   Otherwise, firms are waiting for decisions from the U.S. All of this delays design, building, and testing. The example cited was that the company designed a piece of equipment against what it thought was the requirement. It was clear from the onset that there could be deficiencies. They ran the equipment, and there were indeed problems, but not the deficiencies that were anticipated. The firm got new specifications and had to redesign the piece of equipment, all of which is normal in design of new equipment. However, delays generated from ITAR generated an extra year of work and added tens of millions of dollars in cost.

Additional Costs: Less Than Optimal Supply Chains

The issue of delay directly had an impact on the costs of suppliers for the JSF project. Citing an example, an industry participant noted that bearings for a component of the JSF are made by one U.S. firm. They could be acquired from a European firm at a lower cost and with a more secure supply chain. However, ITAR makes it easier to stay with the existing supply chain and deters any effort to drive down costs and obtain greater security. The rough estimate provided by the interviewee is that there is an additional 30% increase in JSF unit costs due to the impact of ITAR.

Another industry representative noted that a company cannot work with another firm without first getting U.S. approval, which makes it difficult for companies to make changes and improvements, particularly due to the long delays involved. Indeed, ITAR forces firms to decide on the entire supply chain from the beginning, removing the flexibility which would allow for better decisions on suppliers. The interviewee used a hypothetical example: a firm in Poland may be cheaper and better at providing a particular item. But it is far easier for the UK firm to pick an approved supplier, even if it is not better or cheaper. The interviewee also cited a concrete JSF example. The firm sought to have supplier workshops which require amendment of the license. After 14–16 months, the company was still waiting for approval as the U.S. continued to ask for details on issues such as who would attend, what information would be shared, and why more U.S. firms were not included.

In short, as noted by another industry participant, ITAR leads to a sub-optimization in the performance of the supply chain. The difficulty in adding approved firms to the list restricts the ability of companies to search for the best suppliers, which adds to costs. It is not possible to use Chinese firms on the JSF. But even with regard to a potential UK supplier, the issue is whether the UK firm is willing to wait 6–12 months for a decision on a new supplier.

One interviewee noted that while some new suppliers may be worthy of consideration, they are not on the Technical Assistance Agreement (TAA). That means a 9-month wait for approval from the U.S. The added complication is that the UK firm has to

make the request to Washington through the U.S. firm with which it is working on the JSF. So the UK firm is hindered in numerous ways from getting the best suppliers. As a result, the firm simply falls back on using old, approved suppliers, as it is difficult to conduct competitive tendering and search for replacement suppliers under a process that takes months rather than weeks. This led the interviewee to cite the following example. A fire at one of its suppliers made it impossible to get supplies, but the firm determined it was better to wait for the company to rebuild the facility, rather than seek clearance for a new supplier from the U.S.

The interviewee noted that the UK firm has numerous prime suppliers, each of which may have numerous sub-tiers, with each of these possibly having even more sub-tiers. Due to ITAR-driven requirements and timelines, the basic question is "who is approved," rather than "who provides best value." As the representative noted, if approvals could come in 6–8 weeks, this weakness in the process could be addressed. That is not possible with a period of 9–12 months for approvals. The effect for all suppliers generates inefficiencies and greater cost. Ultimately, the costs simply get passed along from the sub-tiers to the prime suppliers to the U.S. prime and the U.S. government.

Additional Costs: Generation of Extra Work

One issue involved the extent to which ITAR forced UK firms to do more work than was otherwise needed for little apparent reason. The statement on the Likert scale questionnaire was "U.S. requirements generated substantial additional work." For industry representatives, the average was 7.5 and for government representatives, 6.6.

Strongly Disagree									Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10	
		(1)		(1)	(1)	(1)	(1)	(1)	(3) (Ind.)	
			(1)		(1)	(2)	(2)		(Gov.)	

One government representative asserted that ITAR requirements had generated a substantial amount of additional work. With regard to specific examples of how that occurs, one industry participant returned to the issue of delay and suppliers, and questioned why it was necessary for the firm to go back to the U.S. for approval to work with a UK or European firm that had been vetted and approved elsewhere by the U.S. Another industry interviewee noted another manner in which ITAR-imposed delays can generate extra work, citing the example of the development of a new component in coordination with a U.S. firm. The UK firm wanted to begin some of the initial work with the U.S. firm before the amended license approval arrived. As that was not possible, the UK firm was forced to undertake the work under a more compacted and less efficient timetable.

Additional Costs: Administration of ITAR

Delay was only one ITAR-related cost that was cited by UK representatives. Another involved administrative costs in connection with ITAR-compliance. One industry participant noted that the company had to pull a lot of personnel together to form teams to address ITAR requirements, all of which generated administrative costs. Another industry interviewee commented that 600 people in that company have been trained on ITAR details to ensure no mistakes occur. And the company had instituted a new computer training program. The interviewee added that many sections of the company were not familiar with ITAR, so there was an extensive amount of training which needed to be conducted,

emphasizing the point that while this is not a problem for a large firm, small firms cannot afford this cost.

Another industry representative stated that everyone in the company working on JSF gets ITAR training every year. Indeed, knowledge of ITAR is essential for those people working on JSF. The interviewee added that the rotation of U.S. personnel working on JSF means the UK often briefs U.S. officials on the requirements. All of this has proceeded well, as the company is determined to avoid any ITAR breach, but entails time and effort to generate a change in the firm's working culture. One industry participant echoed the view that the company's employees working on JSF may know more about the ITAR than U.S. firms. The firm created a compliance team to work solely on JSF, which was something the company has never done before. Personnel from the legal department, administration, and other departments were brought into the group. The rest of the firm also became more aware of the significance of compliance with U.S. requirements, and also provided indirect support.

Citing an example which went beyond JSF to the issue of the impact of U.S. policy, another industry interviewee made the point that the company now has an export control team, but did not establish it until 2002. Until then, business was under straightforward government-to-government arrangements or old projects with established relationships. For old projects, the existing licenses were assumed. However, one item had been licensed to the firm in the 1950s from a U.S. firm. Over the coming decades, the UK firm developed the item independently and added considerable intellectual property rights (IPR) to the point that it was essentially a distinct product. The company had paid for the use of the IPR and had not even spoken to the U.S. firm about the item for a long time. However, when U.S. sanctions against a particular country came into effect, the UK firm could not sell that item to that country due to the presence of a handful of parts to the original design. The fact that there was no time limit on the ITAR control (any advanced technological information having ceased to be secret or innovative many years before) and the fact that no de minimus rule applied, was very frustrating and a good example of ITAR having impact far beyond what is reasonable. That convinced the UK firm of the need for a unit focused on U.S. export control requirements.

Additional Costs: Excessive Complexity

One reason noted by UK representatives for the substantial costs involved in administering ITAR is that it is not an easy or straightforward process. One industry participant noted that ITAR is complex, adding that while the key concepts are easy to understand, the devil is in the details and interpretation of the provisions. What exactly constitutes "access"? What exactly is "disclosure"? The issues are black and white in some instances, but only if the individual or firm is familiar with the substance of ITAR.

One industry interviewee stated there are illogical decisions from the U.S. and no consistency on what is military or non-military. Elements of aircraft design and items such as stealth elements are clearly military. But technical performance data for engines, like length of service, is not really a military issue. Moreover, ITAR coverage provisions on "derived from" or "pertaining to" make it very wide-ranging and not clear to industry. In addition, an industry representative stated that it is not clear what authorizations are for, as they are often vague. Yet another industry participant stated that the ITAR definitions themselves are not precise. Does a reference to forging constitute "technical data"? And another industry interviewee added that ITAR, in some ways, is not difficult, but the key requirement is to have clarity on the regulations, which is currently not the case.

Impact on Performance: General

One other topic of substantial general interest among UK participants is the extent to which the ITAR may affect the ultimate performance of JSF. As one industry representative stated, the rules make it difficult to push the technological envelope. As a result, the decision is to do it in a "safe" way. In addition, ITAR restricts the exchange of data to see if better technical solutions or improvements in capability or performance are possible. And if the goal is to push for potential use of new technology, that requires a quicker turn-around on decisions from the U.S. than is being achieved under the current process. As one government interviewee noted, while it is not possible to cite an instance where technology has been banned from being brought to JSF due to ITAR, it could well have had an impact by driving deliberations toward less technologically sophisticated systems.

One industry representative cited the case in which the UK firm believed that a company from another European country was capable of filling a particular role on JSF. Unfortunately, it took a significant amount of time and effort to get U.S. approval to bring in that company. While the result was successful in this particular instance, the interviewee noted that it would not be surprising if other firms decided not to pursue an option that could generate more performance, capability, or skills simply due to a desire to avoid the complications thrown in the way by ITAR.

Another industry participant addressed the performance issue, and the impact of ITAR, from a different perspective. The individual stated that if the question is put in terms of whether the item actually does what is required on the specification, then the answer is "yes." But the specification itself cannot be challenged, particularly as ITAR requirements make it difficult to get the information to re-evaluate those specifications. Especially as performance data is export controlled, the only way it can be obtained to re-assess the requirement is by relying on data from others. As the interviewee noted, using the traditional formula of obtaining 80% versus the last 20% of performance, ITAR hinders getting the remaining 20% of performance. Another industry representative said that ITAR may not have killed any potential development of JSF technology, but it has affected the ability and willingness of industry to pursue possible avenues of technology development.

Impact on Performance: Restrictions on Information Sharing

The preceding discussion raised the issue of the extent to which ITAR has a significant negative impact on JSF and other projects by restricting the sharing of information. A statement on the Likert scale questionnaire was "U.S. requirements inhibited opportunities to obtain necessary technical data." The industry responses averaged 8.2 and the government representatives, 5.0.

Strongly Disagree									Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10	
			(1)			(1)	(2)	(3)	(2) (Ind.)	
		(3)					*(2)*			*(1)*

One industry representative noted, citing an example, that the interviewee's team was tasked with designing a key JSF component. However, it is not possible to design a component in isolation, and it is necessary to obtain large amounts of relevant data. ITAR made it impossible to obtain this data, such as on operating margins and operating temperatures, so it was not possible to design the component in the most efficient way possible. And the individual made clear that this was not a restriction of information due to IPR, but restrictions imposed by ITAR.

The interviewee provided a second example in which the UK firm was not authorized to know about any additions or modifications undertaken by a U.S. firm to a particular JSF component. The UK firm then had to produce items in which that component was used. Ultimately, the UK firm had to design around the U.S.-modified part, without knowing all the details. This generated difficulties with regard to testing the complete unit, as well as how the entire system would operate, particularly with regard to certain performance scenarios. As a result, the solution was to send the whole system from the UK to the U.S. for testing and then return it to the UK. The interviewee's comment was that getting to 100% of the specified requirement was possible, but it took more time and effort, with additional design work necessary due to the barriers imposed by ITAR.

As another industry participant noted, while a creative work-around can sometimes be found to obtain the required data, in other instances, the UK company's response was simply to give up trying, particularly when the U.S. requirements are exceptionally impenetrable. To cite one experience, there were provisos that were inserted that were marked "U.S. eyes only" even though the UK firm was working on the item.

Impact on Performance: Restrictions on Nationals

An additional aspect of the U.S. restrictions cited by UK representatives involves the focus on nationalities, which generates complications for the UK firm and serves as an inhibition on getting the best possible expertise from the broadest array of sources. One industry participant noted that ITAR is the only export control regime which is based on nationality and not destination of items. The interviewee's firm has 53 nationalities working for it, and the company is banned by UK law from asking about the nationality of applicants for positions. However, as part of its ITAR requirements, it has to list all nationalities, and an employee could be denied access to information due to the employee's nationality. In fact, noted the individual, reconciling UK law and ITAR requirements has still not fully been resolved.

Impact on Performance: Working Relationships

There are also intangible negative impacts from ITAR. To attempt to address one of those areas, a statement on the Likert scale questionnaire was "U.S. regulations complicated work with other industrial participants." The responses from industrial representatives averaged 8.7 and for government representatives, 7.3.

Strongly Disagree									Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10	
					(1)	**(1)**	**(1)**	**(1)**	**(4)**	**(1)**
				(1)	*(1)*	*(1)*	*(1)*	*(2) (Gov.)*		

As one industry representative noted, ITAR adds an "additional bucket of sand" to working relationships. It has a clear impact on communication with other companies involved in the JSF, particularly because of the limitations on information exchange noted previously. ITAR requirements add complexity to what would be a normal interaction, which is particularly the case with high technology items. While this is difficult to quantify, added the individual, it has a significant impact on working relationships. As one government participant noted, the manner in which the U.S. handles sensitive items makes it exceedingly difficult for the UK, citing the example of one meeting at which a ridiculously small number of seats were made available for UK representatives. One industry interviewee noted that at some JSF meetings, non-U.S. citizens were told to leave at certain

points. In one instance, that meant that the firm had one U.S. national remaining in the room, while the rest of the UK team was asked to leave.

Concerns Regarding IPR

The issue of IPR and ITAR has two different aspects. The first involves the UK perception that U.S. firms use ITAR to protect U.S. IPR. One industry participant commented that while work with other companies in other nations is always complicated, some U.S. firms use ITAR to protect their IPR. One government interviewee concurred that the U.S. uses ITAR to protect the IPR of U.S. firms. Another government representative noted that there are still numerous IPR issues involving JSF which need to be addressed. However, the interviewee shared the view that ITAR has been used by U.S. firms as a security device to prevent IPR from being passed on to competitors.

The second issue involving IPR and ITAR involves the interest of UK firms in protecting their IPR, and the impact of ITAR on their IPR. One industry interviewee noted that some of the work it has been doing in the UK is being moved to the U.S., and the concern of the UK firm is to ensure that there are no improvements done in the U.S. The goal is to have the IPR on those products maintained in the UK. Should any work be done in the U.S., it will become "contaminated" by ITAR and would have a long-term impact on the ability of the UK firm to use its original IPR. As noted by one government representative, while firms want to work on a major project like JSF, they are concerned about protecting their IPR. These concerns have led to difficulties with regard to integrating technology onto JSF, as European partners have been reluctant to share information on METEOR or ASRAAM with the U.S.

One industry participant noted that a key factor is the difference in practice of U.S. and UK firms in military cooperative projects. A firm wants control over sharing of information, as information is the life blood of the business and must be protected. U.S. firms have minimal interest in IPR on military projects in which it participates, as that is funded by the U.S. government, and while companies own any IPR paid for by the U.S. government, the U.S. has an unlimited license to exploit and use. Non-U.S. companies contribute intellectual property which has been funded privately or by other governments. Although there are processes to identify and protect this IPR, they are not accorded the respect which is expected or required. Certainly, non-U.S. firms need to protect their IPR in such projects. Moreover, UK firms have a concern about the U.S. government then sharing UK information with U.S. firms, added the individual, as the U.S. seems to assume it can do so when and if it wishes. As a result, some UK firms will not want to participate in U.S. projects, and some smaller UK firms may decide they do not want to work with a larger UK firm in a U.S. project due to concerns about whether the U.S. will protect its technical information.

Excessive ITAR-Control

The preceding discussion touched on one of the key frustrations voiced by UK representatives: the unreasonably excessive reach of U.S. export control and technology transfer regulations. The fact that ITAR controls come into play on the JSF is no surprise. However, when ITAR comes into play on projects such as the Eurofighter Typhoon, it generates intense UK frustration. One government participant commented that the "viral effect" of ITAR is a problem. One industry representative said the company asks why it has to put up with complex and onerous U.S. requirements due to the relatively small number of U.S. components in the Typhoon.

One interviewee cited a particularly egregious example of ITAR-generated difficulties. A test aircraft was flown in Austria with one ITAR component. Retransfer approval was needed from the U.S., which said "yes" but included the proviso that the U.S. manufacturer of the component had to watch the test flight. That involved the cost of an individual viewing one piece of equipment for months. The representative stated bluntly that this is ITAR "insanity."

However, it is the issue of the impact of ITAR on IPR that generates greater frustration. One industry interviewee stated that ITAR is like "one drop of cyanide in a bucket of water. Once you've put the smallest drop in, everything becomes contaminated." It makes it hard for the UK company, because it may want to find other uses for its products. To cite one example, the individual noted that a civilian product that goes to the U.S. and has something added which is ITAR-related (like special paint) becomes an ITAR-controlled item. A firm wants to avoid having to produce two lines of items, so the company would not go to the U.S. and risk ITAR "contamination" for the whole product line. These are illogical decisions, and have no consistency on what is military and non-military. If a product is developed and applied on a civil project, there would be no problems whatsoever. But as soon as it is put on a military project, it becomes ITAR controlled.

Specifically on the JSF, one government representative stated that there will be "contamination" when UK software is mixed with U.S. software, which will generate a problem for future UK sales to other countries. With regard to UK industry, the "contamination" factor deters firms from bringing technology to projects like JSF. In addition, it generates friction in the UK–U.S. relationship. The UK feels UK technology is being "stolen" by the U.S. under ITAR. Two examples are LED screen technology and night-vision goggles. If there is co-development and technology sharing with the U.S., the U.S. then slaps on ITAR restrictions, and the UK cannot freely use the technology. However, added the interviewee, it is not clear if this is a result of a deliberate U.S. policy or the lack of joined-up government in the U.S. regarding ITAR.

ITAR as Trade Barrier

Such comments indicate the perception among many UK representatives that the U.S. is using ITAR as a trade barrier. One industry participant stated that U.S. firms use ITAR to protect their business interests on key areas such as work-share. One government interviewee added that ITAR can be used as a hindrance to non-U.S. firms. Another government participant stated that the result of the complications inherent in the U.S. process is that large U.S. firms take a default position of not working with non-U.S. firms. One industry interviewee cited an example in which the U.S. company it is working with on JSF used the ITAR as an excuse to defend a particular decision. The example involved software developed for use in JSF. The UK firm was informed by the U.S. company that it was excluded from this work on the basis of security concerns, but never received a clear response from the U.S. government or the U.S. company. It was offered work on other systems, which it accepted, but the perception in the UK firm was that the U.S. company appeared to have used ITAR to cover a business decision, and the UK firm could not challenge the outcome.

The interviewee added that the cynical view might have been that the U.S. company had simply wanted to have the UK firm on board to show that it had international participation in JSF. Once the complexity of the working relationship became clear, the U.S. company may have decided that it was too difficult, and it would simply be better to work with U.S. companies. To cite yet another example, the UK firm had noted its capabilities in yet another area of potential work with the U.S. company. The U.S. company eventually

responded that the U.S. government would not give access to the UK firm to work in those areas. However, it again was not clear about the rationale behind that U.S. government decision, merely stating that for "reasons of affordability," it would be handled as a responsibility of the U.S. company. The interviewee stated that, as there was no transparency in the process, it is not clear if that outcome genuinely was due to a decision by Washington, or the U.S. company looking for an excuse to capture work in a strategic area and change an informal agreement that the UK firm would have that line of work.

However, another industry representative provided the contrasting view that "if the prize is big enough and where this becomes a barrier to entry, I would expect UK industry would (1) push for a U.S. government ruling as opposed to accepting U.S. industry interpretation, or (2) look for UK government support in presenting a challenge." And it is notable that Chairman Arbuthnot expressed his view that he does not share the general perception that the U.S. government has a policy of trying to use ITAR as a trade barrier. Instead, he commented, it is more a case of individuals within different parts of the U.S. government acting in an unhelpful way. Moreover, said the Chairman, it is a haphazard process in which U.S. officials seem to feel that it is not in the interest of U.S. industry to expedite the handling of ITAR requests.

ITAR Process—"Sloppy Work"

Chairman Arbuthnot's comments crystallize the views of UK representatives that, whatever defense can be provided on the goals of U.S. policy, the implementation process is unacceptable. Arbuthnot frankly stated that the ITAR regulations are not only unnecessarily bureaucratic, but are used as an excuse for "sloppy work" and added that the process hits "a number of buffers at a lower level of the bureaucracy in Washington."

One example cited by a government participant involved the UK acquisition of data regarding Chinook helicopters. The UK obtained approvals from Boeing, the U.S. Army, and the Secretary of Defense. However, "some Major, some place, said 'no' and 'no' was what stuck." Speaking candidly, the interviewee commented that such incidents make the UK think that the U.S. "cannot be that incompetent," so it must be an intentional U.S. policy. Another government interviewee stated that there are outrageous stories of U.S. decisions related to the JSF. For example, Canada needed a JSF for an exhibition. As the plane wound up taking a different route due to a bridge being closed, Washington required a new license. One government participant cited a non-JSF example where the UK received approval from Washington, but a proviso was included that the data (telemetry) could not be given to the U.S. Army.

U.S. Attitudes—Technology

One complicating factor which has an impact on UK perceptions of JSF and U.S. policies involves the UK perception that the U.S. places little value on UK technology. Chairman Arbuthnot stated that the UK has a claim on a good industrial share of the JSF, which it deserves based on merit. However, he continued, there is a sense that UK technology is not regarded seriously by the U.S., and as a result, there is a "humiliation" factor in the background. One industry representative noted that the company had arranged a session with representatives of the U.S. government to show that the UK could bring quality technology to the JSF project. However, the U.S. showed no interest. One government representative stressed that the UK has areas of good technology, as do other European countries. The U.S. should see it in its own interest to have a capable European defense industry as a partner, as well as to generate competition.

U.S. Attitudes—Political Policies

An additional complication arises from the impact of a variety of U.S. policy decisions. One industry representative stated that U.S. "arrogance" makes it act like a "bully" without regard for requirements or export policies of other countries. And the mercurial nature of U.S. policy changes makes it difficult to be assured of consistency in supply and support arrangements. In cases in which long-term planning is required, there is a need for stability and security, and countries apparently have little faith the U.S. will provide such stability. As an indication of how countries respond to the threat of those U.S. policy shifts, the interviewee noted that Switzerland purchased HAWK along with supplies and spares to last 25 years, in order to be assured of supplies.

U.S. (and UK) Attitudes—Source Codes

A discussion of U.S. attitudes with regard to the UK is the natural transition to one of the key JSF questions regarding U.S. export control and technology transfer policy: In light of the 2009 statement from the JSF project office that source codes will not be released, will the UK be denied access to JSF source codes? Chairman Arbuthnot was quite explicit on the matter. He noted that he had worked on this issue extensively for some time, and had emphasized that it is important for the UK to have the source codes. In 1996, as Minister for Defence Procurement, he had the general view that UK participation in what would eventually be the JSF was beneficial to the UK. However, he also believed the UK should pull out of the project if it could not have guaranteed access to critical items such as source codes. That remains the key issue, stressed Arbuthnot, which is critical to the UK ability to upgrade the JSF as the UK wishes, without requiring U.S. approval. And if the UK does not have that ability, it would be at the mercy of the U.S.

Without resolution of this issue, continued the Chairman, the UK could not proceed with plans to use the French Meteor missile on the JSF. This would effectively mean the end of the European missile industry. The French firm MBDA, which is providing Meteor, will do the integration of the weapons system to the JSF and is central to the source code issue. If MBDA is not able to have the access to source codes to handle weapons integration properly, this would be a major concern for the UK. Arbuthnot stated that the Defence Committee is focused on the JSF source code issue and U.S. policy. He emphasized that source code access relates to UK operational independence. And without exaggerating the point, continued Arbuthnot, there is a certain UK "paranoia" regarding U.S. actions on the JSF. Some of this is based on past experience, such as when the UK was not told about changes the U.S. made to the size of the bomb bays for the JSF. With regard to the 2009 JSF project office announcement on source codes, Arbuthnot noted that this is not a major concern for the UK at this time, as there are many more important issues which take priority and require the Committee's attention. However, stressed Arbuthnot, this matter could become important as the actual procurement decision on JSF comes closer.

Aside from the Chairman's comments, the views expressed by government and industry representatives about the UK eventually getting access to source codes ranged from cautiously optimistic to deeply skeptical. One industry representative noted that the UK firm is still getting the code that it needs at this time, and there have been no problems for that firm. While there had been difficulties getting source codes from the U.S., they eventually were provided. The individual added that while it may not be all the firm wants, it is what the firm needs. A government participant stated that the UK has had its expectations met so far, and has gotten what it needs on JSF up to this point. The UK has said it will ensure it has operational sovereignty, which means the UK can do what it needs to do on the JSF, where and when it needs to do it. If it is the case that upgrades are better

done in the U.S., it is possible that this would not be a problem for the UK. But on operations, there is no reason for the UK to anticipate problems with the U.S.

Another industry interviewee stated that the firm has worked on JSF under an arrangement that assumes it will not get source code access. This certainly generates difficulties resulting in the UK firm having to find complicated "work-arounds," or simply having U.S. firms do the work. Another industry participant stated that source code access has been a constant problem. The UK firm was never allowed near anything associated with the software, which has not helped the UK firm in understanding how the systems work. The view of the interviewee is that this will remain an obstacle in the future, with UK firms not having a full picture of what systems are doing at the time failures occur.

U.S. Attitudes—Practical Working Relationships

The question arises how anything gets done on JSF or, in general, when ITAR comes into play. The answer from UK representatives is that difficulties are often ironed out due to good working relationships. One statement on the Likert scale questionnaire was "U.S. requirements had a significant, negative impact on the working relationship with U.S. officials." The responses from industry representatives averaged 3.0 and for government representatives, 3.0.

Strongly Disagree									Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10	
(1)	(3)		(2)		(1)					(2)
(2)	(1)	(1)	(1)			(1) (Gov.)				

One industry participant stated that he has regular contact with U.S. government officials on JSF and there have been no major problems. Indeed, there has been strong support from the U.S. The UK firm had 230–240 people working on the JSF in the U.S. 3–4 years ago, and still has 80 personnel working on the project in the U.S. And the U.S. has a dozen people on-site to work full time on security, supply, and other issues and adjudicate proposed changes. The firm's personnel in the U.S. have a good relationship with U.S. counterparts. Certainly there are restrictions on UK personnel, but as they have been in the U.S. for a long time, the arrangement works well. The working environment has developed over a lengthy period of time, and certainly in the JSF development phase, U.S. regulations have not been an insurmountable impediment. However, they could be a concern in the future, conceded the interviewee, and the relationship will be tested more as JSF progresses. Basically, U.S. behavior is geared to helping the UK firm despite U.S. regulations. But the UK will need to push the U.S. for more dialogue.

However, another industry representative, while agreeing that resolution of problems comes down to personal relationships, stated that when the firm works directly with Washington, things can get difficult. To a degree, the firm has reasonable relationships with U.S. officials, and generally those individuals have been knowledgeable. The firm works with the JSF project office to resolve problems and issues. In the early stages, however, the firm got little instruction on the regulations, and the U.S. response was "just go read the ITAR." But as the working relationship developed, there was more U.S. help on getting clarifications.

The UK firm and the JSF project office, noted the interviewee, can also have heated exchanges, mostly due to the delay in getting responses urgently needed by the UK firm. And sometimes the U.S. puts in provisos which the company did not expect, or at times does not even know about. Much depends on the license, and a well-drafted broad scope in

the license gives the firm the required flexibility. On issues such as hardware or technical data, the license may be silent, so the company has to work to find a solution. Usually that can be done, but it can take 2–3 months to get that answer out of the U.S. One industry participant noted that the key was the attitude of the U.S. entity involved. The JSF project office did not generate an "us versus them" culture, nor did Lockheed Martin. However, other U.S. firms generated precisely the "us versus them" culture that made work difficult for UK firms.

For UK government representatives, the general impression was of a cooperative arrangement with U.S. officials. One government interviewee noted that the UK has some 35 people at the JSF project office, Lockheed Martin, and the JSF testing facility. These are UK personnel who are there in place of U.S. staff, not as a supplement to U.S. staff. There have been no problems obtaining clearances for the UK personnel. That has allowed the UK to acquire valuable experience, while also bringing UK experience in areas such as safety and logistics to the JSF project. In general, if the UK wants data to be able to make decisions, it has gotten it from the U.S.

UK Attitudes on U.S. Relationship

One government representative forcefully asserted that the problem may actually be UK attitudes with regard to its relationship with the U.S. The result is not a problem with what the U.S. requires under its export control regime, but how the UK assesses those requirements, and the assumptions it makes about U.S. actions. In this individual's view, the UK has such a firm adherence to a policy that it should be with the U.S. and use U.S. material, that this leads to "perverse" results. To cite one example, at the onset of UK participation in JSF, the numbers provided by the UK government did not match the joint project numbers. There were bad UK behaviors driving a policy to spend a "fortune" to buy U.S. equipment and stay in step with the U.S. On JSF, stated the individual, the UK is ultimately paying a lot of money to be an exporting country just like any other JSF participating state. There has not been any institutional learning displayed by the UK government. The interviewee's frank assessment is that the UK will not ultimately get everything it wants from the U.S., and "the UK will not have sufficient operational sovereignty on the JSF." But the individual's perception is that the UK is too far into the project to change course.

Chairman Arbuthnot echoed those points to a degree, stating that it is important for the UK and U.S. to work together in the defense area, noting that this could mean that the UK would simply buy defense material from the U.S. that it cannot produce itself. But he added that it is important that both nations have capable, competing defense industries. And it is also important that Europe does not have to "knuckle under" to the U.S.

ITAR-Free

That last reference by Chairman Arbuthnot led to his strong statements on the move among UK and other European firms to produce ITAR-free items, as noted by Bialos, Fisher, and Koehl (2009, p. 20). Arbuthnot frankly stated that UK industry wants to design around ITAR and proclaim that their items are "ITAR-free," adding that this is something that should generate concern in the U.S. He continued by stating, "In all candour, I would encourage UK industry to design around the ITAR and produce ITAR-free items." Why, asked Arbuthnot, design something that will become enmeshed in ITAR? European defence cooperation is going forward, and that is not simply due to ITAR concerns. It is a reflection of the benefits that are possible by working closely with an Ally, and is wrecked by ITAR.

One government representative commented that, in general, there is growing sentiment in both foreign governments and non-U.S. firms to do whatever is needed to avoid entanglement with ITAR. Another government interviewee concurred that experience has generated an impetus in UK industry to produce ITAR-free military items. In France, there is a government policy of using ITAR-free items, and the trend is spreading throughout Europe. Another government participant commented that France and Germany have gone to their industries and made clear they want ITAR-free goods, and there is anecdotal evidence that contractors, particularly in Germany and France, have indeed started to design components around ITAR. One industry representative stated that customers are now asking for, and firms are designing, ITAR-free items. For large items or older items, that is difficult. But for new items, that is entirely possible. To cite one example, on the A-400M transport, AMSL has asked suppliers for items which are ITAR-free. One industry participant commented that for small and medium-sized firms, it would make sense to do everything possible to avoid ITAR.

Reform of the U.S. System

All of the preceding comments indicate the overwhelming UK government and industry view that even with the most generous perspective of the U.S. system, it is fundamentally flawed. Chairman Arbuthnot stated that it would be better if the U.S. followed what Secretary of Defense Gates is trying to do and generate tighter controls and higher walls on a smaller number of sensitive items. In addition, the number of existing rules must be reduced. Indeed, continued Arbuthnot, there would be a major impact if Secretary Gates is not successful in his efforts to reform the U.S. regime. Difficulties would arise in any event, as the disparity between U.S. and European defense capabilities grow, but reform of U.S. regulations would have a major impact in addressing potential future problems.

One government representative echoed the view that the way to improve ITAR would be to have higher walls on a smaller number of key items. The U.S. has to identify the crown jewels that it wants to protect and then put greater protection around this small set of items. The fact that the ITAR coverage in some instances now goes down to the level of controlling nuts, bolts, and screws is unnecessary. And clearer, simplified regulations would make it easier for small and medium-sized UK firms to make a decision on whether they want to participate in a U.S. project. With regard to the need for simplified, transparent processes, a single, integrated U.S. agency to make export control decisions is important. Even if the substance of the ITAR were unchanged, a better process would make a major difference. And more reasonable actions by U.S. officials would generate a big improvement, if it removed the small, aggravating instances in which a small mistake generates the return of the entire application.

Prospects for Reform

Unfortunately, there appears to be substantial UK pessimism that the Obama Administration efforts to reform the U.S. export control and technology transfer regime will be successful. Drawing on his personal experience, Chairman Arbuthnot cited one reason for skepticism. He stated that when the UK Defence Committee has gone to Washington to speak to the executive branch about the need to reform a "broken" U.S. system, it is told to talk to Congress. When the members speak to counterparts in Congress, the message to the Committee is to speak to U.S. industry. And when the committee members speak to industry, the response they receive is to talk to the executive branch.

One industry interviewee also expressed pessimism about the chances that the U.S. will improve and simplify ITAR. One government participant provided a detailed rationale for the view that the prospects for export control reform are "poor." There is no evidence that congressional staff have any concept of how dangerous the current approach is for long-term U.S. interests. The message being delivered to congressional staff is to protect U.S. industry, and Congress appears to buy that message. Moreover, the Obama Administration is still relying on parochial ways of addressing this topic. As a result, the discussion of higher walls around fewer items sounds good, but the UK has heard this message before. Basically, there is a concern that congressional reaction remains an obstacle to serious U.S. reform.

Logistical Support

It appears to be too early in the process for UK representatives to have a concrete view on the general issue of JSF logistical support and the specific issue of whether the ITAR will have an impact. One statement on the Likert scale questionnaire was "I anticipate that U.S. requirements will have a major negative impact on the ability of the UK to provide logistical support for the JSF." For industry representatives, the average was 7.2 and for government representatives, 4.1.

Strongly Disagree									Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10	
				(1)	(2)		(3)		(1)	(2)
(1)	*(2)*	*(1)*					*(1)*	*(1) (Gov.)*		

One industry participant noted that there is no expectation for country specific solutions regarding JSF logistical support, and the UK and other participating countries will be drawing from the U.S. support network. Global solutions on sustainment requirements will be huge, and it is conceivable that Lockheed Martin will not be able to do it all, so UK and other firms will compete for whatever work is made available to other firms. The interviewee said that UK firms could try to be the regional support lead, but it is too early to tell if that will happen. Another industry interviewee stated that ITAR plays a role in company planning on JSF logistical support. The U.S. is setting up the rules, which will be global, but there may be hubs around the world and assembly lines in differing countries. Such an arrangement would require ITAR licenses around the world. In that regard, the interviewee noted that the U.S. should keep in mind that other countries, including the UK, have their own licensing regimes and requirements. As noted by government representatives, that could lead to an interesting situation if countries such as Israel are brought in to the JSF. The JSF is unique because of the extensive UK involvement in so many areas. Indeed, noted one individual, it is a partly a UK aircraft.

A government participant commented that in the early work on JSF logistical support, the UK is having fewer problems with the U.S. than with other states. Indeed, at this time, the government does not see risks with regard to JSF support and supplies. There is a public Declaration of Principles with the U.S. that makes it unlikely that the U.S. will refuse to supply the UK with what it needs on the JSF. In general, the UK is looking to establish joint support chains with the U.S., although this could admittedly be tricky on the JSF.

Another government representative stated that work on a variety of fronts regarding the JSF is picking up in intensity. Pilots are now flying test versions of the JSF, logistics and support questions are being discussed, and infrastructure questions for the UK will get more attention. On the general issue of support, the interviewee noted that industry is more

concerned than the UK government at this point. The UK is now getting access to what is needed at this time from the U.S. to make decisions on logistical support. Some problems involve coordination with other countries and getting data on systems to assess integration issues. In some cases, other countries have not given data, while the U.S. has provided what the UK has requested. However, with regard to overarching UK support requirements, the individual emphasized that the UK will never send a JSF to the U.S. for service. Such an arrangement will not be acceptable to the UK for basic reasons, such as delay, additional cost (fuel), and complication (tanker refueling).

ITAR as a Cost of Doing Business

With the minimal prospects for improvement of the U.S. system, the question which arises is the extent to which UK industry simply accepts ITAR as a cost of doing business in the U.S. With the U.S. defense budget currently larger than the defense budgets of the next 20 nations combined, is it simply worth it for UK industry to accept the difficulties inherent in the U.S. export control and technology transfer regime? Reflecting the fact that there is no definitive answer, Chairman Arbuthnot stated that in some circumstances, ITAR makes the cost of doing business with the U.S. too high, while in other cases, it is an acceptable cost. The U.S. has supported the UK in the area of defense cooperation, but parts of the U.S. system generate serious difficulties and disincentives.

The key problem, particularly for small and medium-sized UK firms, is the general negative perceptions of an inscrutable ITAR process. One industry representative stated that ITAR generates "a certain amount of fear." In many instances, only 5% of the problem may arise from ITAR requirements, and 95% of the problem is a result of panic. Another industry participant said that small firms probably are influenced by their perceptions of the difficulty of the requirements under U.S. regulations. And one government interviewee noted that perceptions drive behaviors, especially in industry. Those that have worked with ITAR and have experience can make the system work.

From the industrial perspective, the cost of doing business by complying with ITAR highlights the different views of large versus medium and small UK firms. One industrial representative stated that it is important for the individual's firm to fight for JSF work. There is a significant information technology multiplier, and the payback for the firm and for the UK in general is substantial. And the industrial work and the potential income that can be generated are considerable. The final numbers bandied about for the JSF project are around $400 billion. If, for example, the UK were able to secure 10% of that amount, that would be huge. And again, while the final arrangements on logistical support are far from being settled, if Lockheed Martin is not able to handle all the support solutions for the JSF, there will be a significant amount of work available for other firms, including UK companies.

Finally, while the interviewees had scores of anecdotes to illustrate the aggravations of the U.S. regime, it is questionable whether the UK is ready to abandon all participation in U.S. projects. One of the statements on the Likert questionnaire was "My experience with U.S. export control and technology transfer regulations leads me to question the value of UK participation in U.S.-led defence programmes." The responses on the industrial representatives averaged 3.5 and for government representatives 4.1.

Strongly Disagree									Strongly Agree	Do not Know
1	2	3	4	5	6	7	8	9	10	
(3)	(1)	(1)	(1)	(1)		(1)	(1)		(Ind.)	
(2)		(1)	(1)			(1)		(1)	(Gov.)	

The commentary from the UK participants would have indicated all the responses coming in at 9 or 10. Certainly, the responses of industry participants were driven by the prospects of the business in the U.S. But in general, it is notable that the aggravation and inefficiency generated by the U.S. regime was still not enough for the UK to say "enough is enough."

Conclusions

In seeking to draw conclusions from the data provided by UK representatives, it is arguably best to do so by continuously asking the question "compared to what?" First, most of the commentary is quite negative and indicates a substantial amount of UK dissatisfaction. This should be a major concern for the U.S., as the UK is arguably the state which is most open to the idea of participating in U.S.-led multinational military projects. Compared to other nations, the U.S. should anticipate a sympathetic ear in the UK. If this is the extent of UK criticism of the U.S. regime, Washington should dread hearing frank commentary from other countries.

However, the second point of comparison is that the aggravation generated by the U.S. export control and technology transfer regime is still not great enough for the UK to walk away from U.S. projects like the JSF. But as the attraction of participating in U.S. projects arises from the substantial funding unavailable elsewhere and the opportunity to work on the best technology, the question is the extent to which UK support will continue if U.S. defense budgets fall and the U.S. technological edge decreases. And the final arrangements for JSF logistical support and the extent to which non-U.S. firms will be able to participate are critical factors which will warrant future research. If the long-term benefits for UK firms on JSF support are far less than anticipated, that will have an impact on the extent of UK enthusiasm for participating in U.S.-led projects and putting up with ITAR.

The third and final comparison is arguably the one which is of greatest utility, particularly to the U.S.: what type of export control regime does the U.S. have, and what type of regime should it have? UK participants recognized the need for the U.S. to regulate sensitive technologies. They had strong support for efforts by the Obama Administration to improve the system in order to enhance security of truly sensitive technology. Moreover, they had suggestions for practical steps on process that could remove unnecessary complexity and aggravation. Simply put, the U.S. may wish to consider what requirements and processes support a clear policy goal, and which serve to generate ill-will among some of its staunchest supporters.

The U.S. should not take solace from the responses noted above that the UK is not yet ready to opt out of U.S. military projects. The fact that even in the UK, there is growing support for producing ITAR-free items should be a concern to Washington. If that is the extent of the sentiment in the UK, the U.S. should be greatly concerned about views, policy, and practice in France, Germany, and other countries. In the past, the case could be made that due to the U.S. dominance on military technology and defense spending, other countries and non-U.S. firms were willing to put up with any and all U.S. requirements, no matter how aggravating or onerous. The commentary from UK representatives indicates that may no longer be the case. If the advantages of participation on U.S. projects are indeed diminishing, as is perceived by some UK commentators, it would be in the interest of the U.S. to eliminate the avoidable disincentives generated by its export control and technology transfer regime. The findings of this research indicate that, from a UK perspective, this would mean a U.S. system which is predictable, simple, fair, transparent, and focused on truly sensitive technology.

References

Bialos, J., Fisher, C., & Koehl, S. (2009). *Fortresses and icebergs: The evolution of the transatlantic defense market and the implications for U.S. national security policy*. Washington, DC: Center for Transatlantic Relations. Retrieved from http://www.acq.osd.mil/ip/docs/fortresses_and_icebergs_vol-one.pdf

Summary

- U.S. requirements generated significant delay, increased costs, dampened initiative to increase capability, established critical restrictions on information sharing, and constructed barriers to effective supply chains.

- The U.S. system is too complex and attempts to regulate all items.

- It was too early for UK participants to have solid views on the impact of U.S. requirements on JSF logistical support arrangements.

- There was growing support for UK firms to design ITAR-free items.

- The UK interviewees believed the U.S. needs a system which is predictable, transparent and focussed on sensitive technologies. They were sceptical about the chances of successful reform.

Best Said By …

- "In all candour, I would encourage UK industry to design around the U.S. International Trafficking in Arms Regulations (ITAR) and produce ITAR-free items." -- Rt. Hon. James Arbuthnot, Chairman of the UK House of Commons Defence Committee

- "One of our suppliers had a fire at their facility. We determined that it was better to wait for them to rebuild their facility than try to get U.S. approval for an alternate supplier." -- UK Industry Representative

Costs - Delays and Suppliers

- There was UK acceptance of the need to have an export control regime to protect sensitive technology.
- But the U.S. system is not fit for that purpose.
- ITAR generated critical delays, generally 6-9 months.
- Delays generated a disincentive to look for better or cheaper suppliers.
- The focus was on "who is approved" rather than "who is the best supplier."
- Estimated increase of 30% of JSF costs.
- ITAR delays generated problems for work timelines.

Costs – Administration and Complexity

- ITAR generated substantial extra work, particularly additional administrative costs.
- One company had to train 600 people on ITAR details and establish a computer training program.
- There was excessive complexity and a lack of clarity.
- What is "access," "disclosure," or "technical data?"

Performance – People and Technology

- ITAR added an "additional bucket of sand" to working relationships.
- ITAR made it difficult to push the technological envelope.
- Affected the willingness of UK industry to pursue possible areas of technological development.

- The default position was play it safe.

- Using the traditional 80/20 split, ITAR hinders getting the remaining 20% of performance.

Performance - Information Sharing

- ITAR restricted exchange of data.
- Could not get the data to see if requirements should be challenged.
- Can not design a component in isolation.
- Could not always get details on modifications done in the U.S.
- Restrictions on nationals by ITAR generates practical and legal problems.
  - One firm has 53 nationalities working for it.
 - UK law bans asking about nationalities of applicants for positions.

Intellectual Property Rights

- Perception that U.S. firms used ITAR to protect U.S. IPR.

- UK firms were concerned about impact of ITAR to restrict their ability to use UK IPR.

- If work is done in the U.S. on UK IPR, it would become covered by ITAR and "contaminated."

ITAR Excesses

- ITAR is like "one drop of cyanide in a bucket of water. Once you've put the smallest drop in, everything becomes contaminated."

- Concern that U.S. firms use ITAR as an excuse and a trade barrier to justify business decisions.
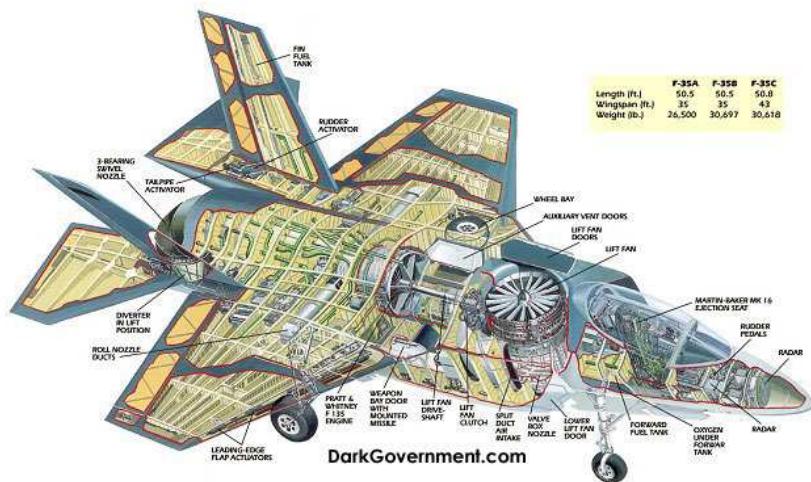
- The U.S. uses ITAR as an excuse for "sloppy work" – Arbuthnot

- There were innumerable horror stories.

UK Access to Source Codes

- Remains a critical issue for the UK, so that it can have operational sovereignty.

- Source codes are key to integrating systems like Meteor on to the JSF.

- Views ranged from cautiously optimistic to very sceptical that UK will get all it needs on source codes.
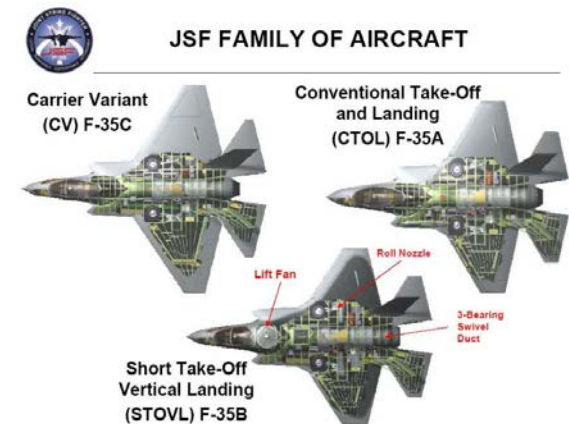
Need For Reform

- Saving grace: good working relationships.
- But growing support for UK firms to design ITAR-free.
- General UK view - the U.S. system is flawed.
- UK supports fundamental reform of the system.
- Higher walls around a smaller number of truly sensitive items.

- ITAR coverage now goes down to nuts and bolts.
- Even if substance of ITAR is unchanged, a better process would make a big difference.
- But scepticism about chances of successful reform.

Logistical Support and Cost of Doing Business

- Too early in the process for the UK representatives to have a clear view on the impact of U.S. regime on JSF logistical support.

- ITAR appeared to be too big a cost of doing business for small and medium-sized UK firms.

- Acceptable for large UK firms due to the amount of money involved & the best technology.
  - Estimates of $400 billion for JSF support work.

JSF FAMILY OF AIRCRAFT

Carrier Variant (CV) F-35C

Conventional Take-Off and Landing (CTOL) F-35A

Short Take-Off Vertical Landing (STOVL) F-35B

- Companies were not yet ready to say "enough is enough."

Conclusions

- Most of the UK commentary was quite negative and indicated a substantial amount of UK dissatisfaction, including growing support for producing ITAR-free items.

- If it is this bad in the UK, how bad must it be elsewhere?

- However, aggravation generated by the U.S. regime was still not great enough for the UK to walk away from major U.S. projects like the JSF.

- But the attraction of participating in U.S. projects arises from the funding unavailable elsewhere and the opportunity to work on the best technology.

- This raises questions about UK support if U.S. defence budgets fall and the U.S. technological edge decreases.

- From a UK perspective, the U.S. should implement a system which is predictable, simple, fair, transparent, and focused on truly sensitive technology.